

- A, cont
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- at least one first oxidation base chosen from para-phenylenediamine compounds other than para-phenylenediamine; double bases; ortho-aminophenols; heterocyclic bases; and acid-addition salts thereof,
 - at least one second oxidation base chosen from para-aminophenols and acid-addition salts thereof,
 - at least one coupler chosen from meta-aminophenols and acid-addition salts thereof,
 - at least one enzyme chosen from 2-electron oxidoreductases, and
 - at least one donor for said at least one enzyme.

33. The composition according to Claim 32, wherein said keratin fibers are human keratin fibers.

34. The composition according to Claim 33, wherein said human keratin fibers are hair.

35. The composition according to Claim 32, wherein said at least one 2-electron oxidoreductase is chosen from pyranose oxidases, glucose oxidases, glycerol oxidases, lactate oxidases, pyruvate oxidases and uricases.

36. The composition according to Claim 32, wherein said at least one 2-electron oxidoreductase is chosen from uricases of animal, microbiological and biotechnological origin.

37. The composition according to Claim 32, wherein said at least one 2-electron oxidoreductase is present in an amount ranging from 0.01 to 20% by weight relative to the total weight of the composition.

38. The composition according to Claim 37, wherein said at least one 2-electron oxidoreductase is present in an amount ranging from 0.1 to 5% by weight relative to the total weight of the composition.

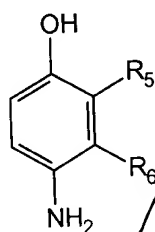
39. The composition according to claim 32, wherein said at least one donor for said at least one 2-electron oxidoreductase is chosen from D-glucose, L-sorbose, D-xylose, glycerol, dihydroxyacetone, lactic acid and its salts, pyruvic acid and its salts, and uric acid and its salts.

40. The composition according to Claim 39, wherein said at least one donor for said at least one 2-electron oxidoreductase is chosen from uric acid and its salts.

41. The composition according to Claim 32, wherein said at least one donor is present in an amount ranging from 0.01 to 20% by weight relative to the total weight of the composition.

42. The composition according to Claim 41, wherein said at least one donor is present in an amount ranging from 0.1 to 5% by weight relative to the total weight of the composition.

43. The composition according to Claim 32, wherein said para-aminophenols are chosen from compounds corresponding to formula (II) below, and acid-addition salts thereof:



in which:

- R₅ is chosen from a hydrogen atom, halogen atoms, C₁-C₄ alkyl radicals, C₁-C₄ monohydroxyalkyl radicals, (C₁-C₄)alkoxy(C₁-C₄)alkyl radicals, C₁-C₄ aminoalkyl radicals, and hydroxy(C₁-C₄)alkylamino(C₁-C₄)alkyl radicals,
 - R₆ is chosen from a hydrogen atom, halogen atoms, C₁-C₄ alkyl radicals, C₁-C₄ monohydroxyalkyl radicals, C₂-C₄ polyhydroxyalkyl radicals, C₁-C₄ aminoalkyl radicals, cyano(C₁-C₄)alkyl radicals, and (C₁-C₄)alkoxy(C₁-C₄)alkyl radicals,
- wherein at least one of the radicals R₅ and R₆ represents a hydrogen atom.

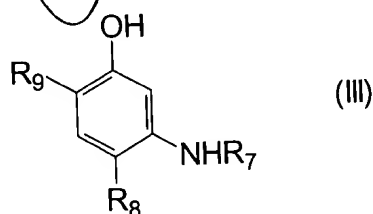
44. The composition according to Claim 43, wherein said para-aminophenols of formula (II) are chosen from para-aminophenol, 4-amino-3-methylphenol, 4-amino-3-fluorophenol, 4-amino-3-hydroxymethylphenol, 4-amino-2-

methyphenol, 4-amino-2-hydroxymethylphenol, 4-amino-2-methoxymethylphenol, 4-amino-2-aminomethylphenol, 4-amino-2-(β -hydroxyethylaminomethyl)phenol, 4-amino-2-fluorophenol, and acid addition salts thereof.

45. The composition according to Claim 32, wherein said at least one second oxidation base is chosen from para-aminophenols present in an amount ranging from 0.0005 to 12% by weight relative to the total weight of the composition.

46. The composition according to Claim 45, wherein said at least one second oxidation base is chosen from para-aminophenols present in an amount ranging from 0.005 to 6% by weight relative to the total weight of the composition.

47. The composition according to Claim 32, wherein said at least one coupler is chosen from meta-amino phenols of formula (III) below, and acid-addition salts thereof:



in which:

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- R_7 is chosen from a hydrogen atom, C_1 - C_4 alkyl radicals, C_1 - C_4 monohydroxyalkyl radicals and C_2 - C_4 polyhydroxyalkyl radicals,
 - R_8 is chosen from a hydrogen atom, C_1 - C_4 alkyl radicals, C_1 - C_4 alkoxy radicals and halogen atoms,
 - R_9 is chosen from a hydrogen atom, C_1 - C_4 alkyl radicals, C_1 - C_4 alkoxy radicals, C_1 - C_4 monohydroxyalkyl radicals, C_2 - C_4 polyhydroxyalkyl radicals, C_1 - C_4 monohydroxyalkoxy radicals, and C_2 - C_4 polyhydroxyalkoxy radicals.

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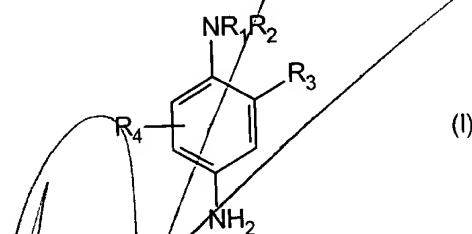
48. The composition according to Claim 47, wherein said at least one coupler of formula (III) is chosen from meta-aminophenol, 5-amino-2-methoxyphenol, 5-amino-2-(β -hydroxyethyloxy)phenol, 5-amino-2-methylphenol, 5-N-(β -hydroxyethyl)amino-2-methylphenol, 5-N-(β -hydroxyethyl)amino-4-methoxy-2-methylphenol, 5-amino-4-methoxy-2-methylphenol, 5-amino-4-chloro-2-methylphenol, 5-amino-2,4-dimethoxyphenol, 5-(γ -hydroxypropylamino)-2-methylphenol and acid-addition salts thereof.

49. The composition according to Claim 32, wherein said at least one coupler is present in an amount ranging from 0.0001 to 8% by weight relative to the total weight of the composition.

50. The composition according to Claim 49, wherein said at least one coupler is present in an amount ranging from 0.005 to 5% by weight relative to the total weight of the composition.

51. The composition according to Claim 47, wherein said halogen atoms are chosen from chlorine, bromine, and fluorine.

52. The composition according to Claim 32, wherein said para-phenylenediamine compounds are chosen from compounds of formula (I) below, and the acid-addition salts thereof:



in which:

- R_1 is chosen from a hydrogen atom, $\text{C}_1\text{-C}_4$ alkyl radicals, $\text{C}_1\text{-C}_4$ monohydroxyalkyl radicals, $\text{C}_2\text{-C}_4$ polyhydroxyalkyl radicals, $(\text{C}_1\text{-C}_4)$ alkoxy $(\text{C}_1\text{-C}_4)$ alkyl radicals, $\text{C}_1\text{-C}_4$ alkyl radicals substituted with a nitrogenous group, a phenyl radical and a 4'-aminophenyl radical;
- R_2 is chosen from a hydrogen atom, $\text{C}_1\text{-C}_4$ alkyl radicals, $\text{C}_1\text{-C}_4$ monohydroxyalkyl radicals, $\text{C}_2\text{-C}_4$ polyhydroxyalkyl radicals, $(\text{C}_1\text{-C}_4)$ alkoxy $(\text{C}_1\text{-C}_4)$ alkyl radicals and $\text{C}_1\text{-C}_4$ alkyl radicals substituted with a nitrogenous group;

- R_3 is chosen from a hydrogen atom, halogen atoms, C_1 - C_4 alkyl radicals, C_1 - C_4 monohydroxyalkyl radicals, C_1 - C_4 hydroxyalkoxy radicals, acetylamino(C_1 - C_4)-alkoxy radicals, C_1 - C_4 mesylaminoalkoxy radicals and carbamoylamino(C_1 - C_4)-alkoxy radicals,

- R_4 is chosen from a hydrogen atom, halogen atoms, and C_1 - C_4 alkyl radicals;

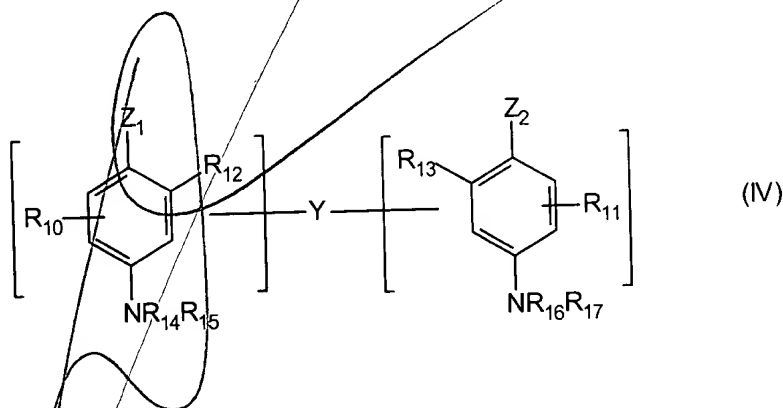
wherein at least one of the radicals R_1 to R_4 is other than a hydrogen atom.

53. The composition according to Claim 52, wherein said R_3 halogen atoms are chosen from chlorine, bromine, iodine and fluorine.

54. The composition according to Claim 52, wherein said para-phenylenediamine derivatives of formula (I) are chosen from para-toluylenediamine, 2-chloro-para-phenylenediamine, 2,3-dimethyl-para-phenylenediamine, 2,6-dimethyl-para-phenylenediamine, 2,6-diethyl-para-phenylenediamine, 2,5-dimethyl-para-phenylenediamine, N,N-dimethyl-para-phenylenediamine, N,N-diethyl-para-phenylenediamine, N,N-dipropyl-para-phenylenediamine, 4-amino-N,N-diethyl-3-methylaniline, N,N-bis(β -hydroxyethyl)-para-phenylenediamine, 4-amino-N,N-bis(β -hydroxyethyl)-2-methylaniline, 4-amino-2-chloro-N,N-bis(β -hydroxyethyl)aniline, 2- β -hydroxyethyl-para-phenylenediamine, 2-fluoro-para-phenylenediamine, 2-isopropyl-para-phenylenediamine, N-(β -hydroxypropyl)-para-phenylenediamine, 2-hydroxy-methyl-para-phenylenediamine, N,N-dimethyl-3-methyl-para-phenylenediamine,

N,N-(ethyl-β-hydroxyethyl)-para-phenylenediamine, N-(β,γ-dihydroxypropyl)-para-phenylenediamine, N-(4'-aminophenyl)-para-phenylenediamine, N-phenyl-para-phenylenediamine, 2-β-hydroxyethyloxy-para-phenylenediamine, 2-β-acetylamino-ethyloxy-para-phenylenediamine, N-(β-methoxyethyl)-para-phenylenediamine, and acid-addition salts thereof.

55. The composition according to Claim 32, wherein said double bases are chosen from compounds of formula (IV) below, and acid-addition salts thereof:



in which:

- Z₁ and Z₂, which may be identical or different, are chosen from a hydroxyl radical and an -NH₂ radical which may be substituted with C₁-C₄ alkyl radicals or with a linker arm Y;

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- the linker arm Y is chosen from linear and branched alkylene chains containing from 1 to 14 carbon atoms, which may be interrupted by or terminated with at least one entity chosen from nitrogenous groups and hetero atoms, and optionally having at least one substituent chosen from hydroxyl and C₁-C₆ alkoxy radicals;
 - R₁₀ and R₁₁, which may be identical or different, are chosen from a hydrogen atom, halogen atoms, C₁-C₄ alkyl radicals, C₁-C₄ monohydroxyalkyl radicals, C₂-C₄ polyhydroxyalkyl radicals, C₁-C₄ aminoalkyl radicals and a linker arm Y;
 - R₁₂, R₁₃, R₁₄, R₁₅, R₁₆ and R₁₇, which may be identical or different, are chosen from a hydrogen atom, linker arms Y and C₁-C₄ alkyl radicals;
- wherein said compounds of formula (IV) and salts thereof contain only one linker arm Y per molecule.

56. The composition according to Claim 55, wherein said hetero atoms are chosen from oxygen, sulfur, and nitrogen.

57. The composition according to Claim 55, wherein said double bases of formula (IV) are chosen from N,N'-bis(β-hydroxyethyl)-N,N'-bis(4'-aminophenyl)-1,3-diaminopropanol, N,N'-bis(β-hydroxyethyl)-N,N'-bis(4'-aminophenyl)ethylenediamine, N,N'-bis(4-aminophenyl)tetramethylenediamine, N,N'-bis(β-hydroxyethyl)-N,N'-bis(4-aminophenyl)tetramethylenediamine, N,N'-bis(4-methylaminophenyl)-tetramethylenediamine, N,N'-bis(ethyl)-N,N'-bis(4'-amino-3'-methylphenyl)ethylenedi-

amine, 1,8-bis(2,5-diaminophenoxy)-3,5-dioxaoctane, and acid-addition salts thereof.

58. The composition according to Claim 32, wherein said ortho-aminophenols are chosen from 2-aminophenol, 2-amino-5-methylphenol, 2-amino-6-methylphenol 5-acetamido-2-aminophenol, and acid-addition salts thereof.

59. The composition according to Claim 32, wherein said heterocyclic bases are chosen from pyridine compounds, pyrimidine compounds, pyrazole compounds, pyrazolopyrimidine compounds, and acid-addition salts thereof.

60. The composition according to Claim 32, wherein said at least one first oxidation base is present in an amount ranging from 0.0005 to 12% by weight relative to the total weight of the composition.

61. The composition according to Claim 60, wherein said at least one first oxidation base is present in an amount ranging from 0.005 to 6% by weight relative to the total weight of the composition.

62. The composition according to Claim 32, wherein said acid-addition salts are chosen from hydrochlorides, hydrobromides, sulphates, tartrates, lactates and acetates.

63. The composition according to Claim 32, wherein said composition further comprises water or a mixture of water and at least one organic solvent.

64. The composition according to Claim 32, wherein said composition has a pH ranging from 5 to 11.

65. The composition according to Claim 32, further comprising at least one peroxidase.

66. A ready-to-use composition for the oxidation dyeing of keratin fibers, comprising:

- at least one first oxidation base chosen from

para-phenylenediamine compounds chosen from: para-toluylenediamine, 2-chloro-para-phenylenediamine, 2,3-dimethyl-para-phenylenediamine, 2,6-dimethyl-para-phenylenediamine, 2,6-diethyl-para-phenylenediamine, 2,5-dimethyl-para-phenylenediamine, N,N-dimethyl-para-phenylenediamine, N,N-diethyl-para-phenylenediamine, N,N-dipropyl-para-phenylenediamine, 4-amino-N,N-diethyl-3-methylaniline, N,N-bis(β -hydroxyethyl)-para-phenylenediamine, 4-amino-N,N-bis(β -hydroxyethyl)-2-methylaniline, 4-amino-2-chloro-N,N-bis(β -hydroxyethyl)aniline, 2- β -hydroxyethyl-para-phenylenediamine, 2-fluoro-para-phenylenediamine, 2-isopropyl-para-phenylenediamine, N-(β -hydroxypropyl)-para-phenylenediamine, 2-hydroxy-methyl-para-phenylenediamine, N,N-dimethyl-3-methyl-para-phenylenediamine, N,N-(ethyl- β -hydroxyethyl)-para-phenylenediamine, N-(β , γ -dihydroxypropyl)-para-phenylenediamine, N-(4'-aminophenyl)-para-phenylenediamine, N-phenyl-para-phenylenediamine, 2- β -hydroxyethyloxy-para-phenylenediamine, 2- β -acetylamino-

ethyloxy-para-phenylenediamine, N-(β -methoxyethyl)-para-phenylenediamine, and acid-addition salts thereof,

double bases chosen from: N,N'-bis(β -hydroxyethyl)-N,N'-bis(4'-aminophenyl)-1,3-diaminopropanol, N,N'-bis(β -hydroxyethyl)-N,N'-bis(4'-aminophenyl)ethylenediamine, N,N'-bis(4'-aminophenyl)tetramethylenediamine, N,N'-bis(β -hydroxyethyl)-N,N'-bis(4'-aminophenyl)tetramethylenediamine, N,N'-bis(4-methylaminophenyl)tetramethylenediamine, N,N'-bis(ethyl)-N,N'-bis(4'-amino-3'-methylphenyl)ethylenediamine, 1,8-bis(2,5-diaminophenoxy)-3,5-dioxaoctane, and acid-addition salts thereof,

ortho-aminophenols chosen from: 2-aminophenol, 2-amino-5-methylphenol, 2-amino-6-methylphenol, 5-acetamido-2-aminophenol, and acid-addition salts thereof,

pyridine compounds chosen from: 2,5-diaminopyridine, 2-(4-methoxyphenyl)amino-3-amino-pyridine, 2,3-diamino-6-methoxypyridine, 2-(~~4~~^B-methoxy-ethyl)amino-3-amino-6-methoxypyridine, 3,4-diaminopyridine, and acid-addition salts thereof,

pyrimidine compounds chosen from: 2,4,5,6-tetraamino-pyrimidine, 4-hydroxy-2,5,6-triaminopyrimidine, 2-hydroxy-4,5,6-triamino-pyrimidine, 2,4-dihydroxy-5,6-diaminopyrimidine, 2,5,6-tri-amino-pyrimidine, and acid-addition salts thereof,

pyrazole compounds chosen from: 4,5-diamino-1-methyl-pyrazole,
3,4-diaminopyrazole, 4,5-diamino-1-(4'-chlorobenzyl)pyrazole,
4,5-diamino-1,3-dimethyl-pyrazole, 4,5-diamino-3-methyl-1-phenylpyrazole, 4,5-
diamino-1-methyl-3-phenylpyrazole, 4-amino-1,3-di-methyl-5-hydrazinopyrazole,
1-benzyl-4,5-diamino-3-methyl-pyrazole, 4,5-diamino-3-tert-butyl-1-methyl-pyrazole,
4,5-diamino-1-tert-butyl-3-methylpyrazole,
4,5-diamino-1-(β -hydroxyethyl)-3-methylpyrazole, 4,5-
diamino-1-ethyl-3-methylpyrazole, 4,5-diamino-1-
ethyl-3-(4'-methoxyphenyl)pyrazole, 4,5-diamino-1-ethyl-3-hydroxymethylpyrazole,
4,5-diamino-3-hydroxymethyl-1-methyl-pyrazole, 4,5-diamino-3-
hydroxymethyl-1-iso-propyl-pyrazole, 4,5-diamino-3-methyl-1-isopropyl-pyrazole,
4-amino-5-(2'-amino-ethyl)amino-1,3-dimethyl-pyrazole, 3,4,5-triamino-pyrazole,
1-methyl-3,4,5-tri-amino-pyrazole, 3,5-diamino-1-methyl-4-methylamino-pyrazole,
3,5-diamino-4-(β -hydroxyethyl)amino-1-methyl-pyrazole, and acid-addition salts
thereof,

pyrazolopyrimidine compounds chosen from:

- pyrazolo[1,5-a]pyrimidine-3,7-diamine;
- 2,5-dimethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;
- pyrazolo[1,5-a]pyrimidine-3,5-diamine;
- 2,7-dimethylpyrazolo[1,5-a]pyrimidine-3,5-diamine;

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- 3-aminopyrazolo[1,5-a]pyrimidin-7-ol;
 - 3-aminopyrazolo[1,5-a]pyrimidin-5-ol;
 - 2-(3-aminopyrazolo[1,5-a]pyrimidin-7-ylamino)ethanol;
 - 2-(7-aminopyrazolo[1,5-a]pyrimidin-3-ylamino)ethanol;
 - 2-[(3-aminopyrazolo[1,5-a]pyrimidin-7-yl)-(2-hydroxy-ethyl)amino]ethanol;
 - 2-[(7-aminopyrazolo[1,5-a]pyrimidin-3-yl)-(2-hydroxy-ethyl)amino]ethanol;
 - 5,6-dimethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;
 - 2,6-dimethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;
 - 2,5,N7,N7-tetramethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;

and addition salts thereof and the tautomeric forms thereof, when a tautomeric equilibrium exists;

- at least one second oxidation base chosen from para-aminophenol, 4-amino-3-methylphenol, 4-amino-3-fluorophenol, 4-amino-3-hydroxymethylphenol, 4-amino-2-methylphenol, 4-amino-2-hydroxymethylphenol, 4-amino-2-methoxymethylphenol, 4-amino-2-aminomethylphenol, 4-amino-2-(β -hydroxyethylaminomethyl)phenol, 4-amino-2-fluorophenol, and acid-addition salts thereof;
- at least one meta-aminophenol coupler chosen from meta-aminophenol, 5-amino-2-methoxyphenol, 5-amino-2-(β -hydroxyethyloxy)phenol, 5-amino-2-methylphenol, 5-N-(β -hydroxyethyl)amino-2-methylphenol, 5-N-(β -hydroxyethyl)amino-4-methoxy-2-methylphenol, 5-amino-4-methoxy-2-methylphenol,

5-amino-4-chloro-2-methylphenol, 5-amino-2,4-dimethoxyphenol, 5-(γ-hydroxypropylamino)-2-methylphenol and acid-addition salts thereof;

- at least one 2-electron oxidoreductase chosen from pyranose oxidases, glucose oxidases, glycerol oxidases, lactate oxidases, pyruvate oxidases and uricases; and

- at least one donor for said 2-electron oxidoreductase chosen from D-glucose, L-sorbose, D-xylose, glycerol, dihydroxyacetone, lactic acid and salts thereof; pyruvic acid and salts thereof; and uric acid and salts thereof.

67. A process for dyeing keratin fibers, comprising applying at least one ready-to-use dye composition for the oxidation dyeing of keratin fibers to said fibers and developing for a period of time sufficient to achieve desired coloration, wherein said ready-to-use dye composition comprises:

- at least one first oxidation base chosen from para-phenylenediamine compounds other than para-phenylenediamine; double bases; ortho-aminophenols; heterocyclic bases; and acid-addition salts thereof,
- at least one second oxidation base chosen from para-aminophenols and acid-addition salts thereof,
- at least one coupler chosen from meta-aminophenols and acid-addition salts thereof,
- at least one enzyme chosen from 2-electron oxidoreductases, and

at least one donor for said at least one enzyme.

68. A process for dyeing keratin fibers, comprising applying at least one ready-to-use dye composition for the oxidation dyeing of keratin fibers to said fibers and developing for a period sufficient to achieve ^athe desired coloration, wherein said ready-to-use dye composition comprises:

- at least one first oxidation base chosen from
para-phenylenediamine compounds chosen from: para-toluylenediamine, 2-chloro-para-phenylenediamine, 2,3-dimethyl-para-phenylenediamine, 2,6-dimethyl-para-phenylenediamine, 2,6-diethyl-para-phenylenediamine, 2,5-dimethyl-para-phenylenediamine, N,N-dimethyl-para-phenylenediamine, N,N-diethyl-para-phenylenediamine, N,N-dipropyl-para-phenylenediamine, 4-amino-N,N-diethyl-3-methylaniline, N,N-bis(β-hydroxyethyl)-para-phenylenediamine, 4-amino-N,N-bis(β-hydroxyethyl)-2-methylaniline, 4-amino-2-chloro-N,N-bis(β-hydroxyethyl)aniline, 2-β-hydroxyethyl-para-phenylenediamine, 2-fluoro-para-phenylenediamine, 2-isopropyl-para-phenylenediamine, N-(β-hydroxypropyl)-para-phenylenediamine, 2-hydroxymethyl-para-phenylenediamine, N,N-dimethyl-3-methyl-para-phenylenediamine, N,N-(ethyl-β-hydroxyethyl)-para-phenylenediamine, N-(β,γ-dihydroxypropyl)-para-phenylenediamine, N-(4'-aminophenyl)-para-phenylenediamine, N-phenyl-para-phenylenediamine, 2-β-hydroxyethyloxy-para-phenylenediamine, 2-β-acetylamino-

ethyloxy-para-phenylenediamine, N-(β -methoxyethyl)-para-phenylenediamine, and acid-addition salts thereof,

double bases chosen from: N,N'-bis(β -hydroxyethyl)-N,N'-bis(4'-aminophenyl)-1,3-diaminopropanol, N,N'-bis(β -hydroxyethyl)-N,N'-bis(4'-aminophenyl)ethylenediamine, N,N'-bis(4'-aminophenyl)tetramethylenediamine, N,N'-bis(β -hydroxyethyl)-N,N'-bis(4'-aminophenyl)tetramethylenediamine, N,N'-bis(4'-methylaminophenyl)tetramethylenediamine, N,N'-bis(ethyl)-N,N'-bis(4'-amino-3'-methylphenyl)ethylenediamine, 1,8-bis(2,5-diaminophenoxy)-3,5-dioxaoctane, and acid-addition salts thereof,

ortho-aminophenols chosen from: 2-aminophenol, 2-amino-5-methylphenol, 2-amino-6-methylphenol, 5-acetamido-2-aminophenol, and acid-addition salts thereof,

pyridine compounds chosen from: 2,5-diaminopyridine, 2-(4-methoxyphenyl)amino-3-amino-pyridine, 2,3-diamino-6-methoxypyridine, 2-(β -methoxy-ethyl)amino-3-amino-6-methoxypyridine, 3,4-diaminopyridine, and acid-addition salts thereof,

pyrimidine compounds chosen from: 2,4,5,6-tetraamino-pyrimidine, 4-hydroxy-2,5,6-triaminopyrimidine, 2-hydroxy-4,5,6-triamino-pyrimidine, 2,4-dihydroxy-5,6-diaminopyrimidine, 2,5,6-tri-amino-pyrimidine, and acid-addition salts thereof,

pyrazole compounds chosen from: 4,5-diamino-1-methyl-pyrazole,
3,4-diaminopyrazole, 4,5-diamino-1-(4'-chlorobenzyl)pyrazole,
4,5-diamino-1,3-dimethyl-pyrazole, 4,5-diamino-3-methyl-1-phenylpyrazole, 4,5-
diamino-1-methyl-3-phenylpyrazole, 4-amino-1,3-di-methyl-5-hydrazinopyrazole,
1-benzyl-4,5-diamino-3-methyl-pyrazole, 4,5-diamino-3-tert-butyl-1-methyl-pyrazole,
4,5-diamino-1-tert-butyl-3-methylpyrazole,
4,5-diamino-1-(~~3~~-hydroxyethyl)-3-methylpyrazole, 4,5-
diamino-1-ethyl-3-methylpyrazole, 4,5-diamino-1-
ethyl-3-(4'-methoxyphenyl)pyrazole, 4,5-diamino-1-ethyl-3-hydroxymethylpyrazole,
4,5-diamino-3-hydroxymethyl-1-methyl-pyrazole, 4,5-diamino-3-
hydroxymethyl-1-iso-propyl-pyrazole, 4,5-diamino-3-methyl-1-isopropyl-pyrazole,
4-amino-5-(2'-amino-ethyl)amino-1,3-dimethyl-pyrazole, 3,4,5-triamino-pyrazole,
1-methyl-3,4,5-tri-amino-pyrazole, 3,5-diamino-1-methyl-4-methylamino-pyrazole,
3,5-diamino-4-(~~3~~-hydroxyethyl)amino-1-methyl-pyrazole, and acid-addition salts
thereof,

pyrazolopyrimidine compounds chosen from:

- pyrazolo[1,5-a]pyrimidine-3,7-diamine;
- 2,5-dimethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;
- pyrazolo[1,5-a]pyrimidine-3,5-diamine;
- 2,7-dimethylpyrazolo[1,5-a]pyrimidine-3,5-diamine;

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- 3-aminopyrazolo[1,5-a]pyrimidin-7-ol;
 - 3-aminopyrazolo[1,5-a]pyrimidin-5-ol;
 - 2-(3-aminopyrazolo[1,5-a]pyrimidin-7-ylamino)ethanol;
 - 2-(7-aminopyrazolo[1,5-a]pyrimidin-3-ylamino)ethanol;
 - 2-[(3-aminopyrazolo[1,5-a]pyrimidin-7-yl)-(2-hydroxy-ethyl)amino]ethanol;
 - 2-[(7-aminopyrazolo[1,5-a]pyrimidin-3-yl)-(2-hydroxy-ethyl)amino]ethanol;
 - 5,6-dimethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;
 - 2,6-dimethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;
 - 2,5,N7,N7-tetramethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;

and addition salts thereof and ~~the~~ tautomeric forms thereof, when a tautomeric equilibrium exists;

- at least one second oxidation base chosen from para-aminophenol, 4-amino-3-methylphenol, 4-amino-3-fluorophenol, 4-amino-3-hydroxymethylphenol, 4-amino-2-methylphenol, 4-amino-2-hydroxymethylphenol, 4-amino-2-methoxymethylphenol, 4-amino-2-aminomethylphenol, 4-amino-2-(β -hydroxyethylaminomethyl)phenol, 4-amino-2-fluorophenol, and acid-addition salts thereof;
- at least one meta-aminophenol coupler chosen from meta-aminophenol, 5-amino-2-methoxyphenol, 5-amino-2-(β -hydroxyethyloxy)phenol, 5-amino-2-methylphenol, 5-N-(β -hydroxyethyl)amino-2-methylphenol, 5-N-(β -hydroxyethyl)amino-4-methoxy-2-methylphenol, 5-amino-4-methoxy-2-methylphenol,

5-amino-4-chloro-2-methylphenol, 5-amino-2,4-dimethoxyphenol 5-(γ-hydroxypropylamino)-2-methylphenol, and acid-addition salts thereof;

- at least one 2-electron oxidoreductase chosen from pyranose oxidases, glucose oxidases, glycerol oxidases, lactate oxidases, pyruvate oxidases and uricases; and

- at least one donor for said 2-electron oxidoreductase chosen from D-glucose, L-sorbose, D-xylose, glycerol, dihydroxyacetone, lactic acid and salts thereof; pyruvic acid and salts thereof; and uric acid and salts thereof.

69. A process for dyeing keratin fibers, comprising:

separately storing a first composition,

separately storing a second composition,

thereafter, mixing said first composition with said second composition,

applying said mixture to said fibers and

developing for a period of time sufficient to achieve the desired coloration,

wherein said first composition comprises:

- at least one first oxidation base chosen from para-phenylenediamine compounds other than para-phenylenediamine, double bases, ortho-aminophenols, heterocyclic bases, and acid-addition salts thereof;
- at least one second oxidation base chosen from para-aminophenols and acid-addition salts thereof; and

- at least one coupler chosen from meta-aminophenols and acid-addition salts thereof; and

wherein said second composition comprises at least one 2-electron oxidoreductase and at least one donor for said at least one 2-electron oxidoreductase.

70. A process for dyeing keratin fibers, comprising:

separately storing a first composition,

separately storing a second composition,

thereafter mixing said first composition with said second composition,

applying said mixture to said fibers and

developing for a period sufficient to achieve the desired coloration,

- wherein said first composition comprises:

at least one first oxidation base chosen from:

para-phenylenediamine compounds chosen from: para-toluylenediamine, 2-chloro-para-phenylenediamine, 2,3-dimethyl-para-phenylenediamine, 2,6-dimethyl-para-phenylenediamine, 2,6-diethyl-para-phenylenediamine, 2,5-dimethyl-para-phenylenediamine, N,N-dimethyl-para-phenylenediamine, N,N-diethyl-para-phenylenediamine, N,N-dipropyl-para-phenylenediamine, 4-amino-N,N-diethyl-3-methylaniline, N,N-bis(β-hydroxyethyl)-para-phenylenediamine, 4-amino-N,N-bis(β-hydroxyethyl)-2-methylaniline, 4-amino-2-chloro-N,N-bis(β-hydroxyethyl)aniline, 2-β-

hydroxyethyl-para-phenylenediamine, 2-fluoro-para-phenylenediamine, 2-isopropyl-para-phenylenediamine, N-(β -hydroxypropyl)-para-phenylenediamine, 2-hydroxy-methyl-para-phenylenediamine, N,N-dimethyl-3-methyl-para-phenylenediamine, N,N-(ethyl- β -hydroxyethyl)-para-phenylenediamine, N-(β , γ -dihydroxypropyl)-para-phenylenediamine, N-(4'-aminophenyl)-para-phenylenediamine, N-phenyl-para-phenylenediamine, 2- β -hydroxyethyloxy-para-phenylenediamine, 2- β -acetamino-ethyloxy-para-phenylenediamine, N-(β -methoxyethyl)-para-phenylenediamine, and acid-addition salts thereof,

double bases chosen from: N,N'-bis(β -hydroxyethyl)-N,N'-bis(4'-amino-phenyl)-1,3-diaminopropanol, N,N'-bis(β -hydroxyethyl)-N,N'-bis(4'-amino-phenyl)ethylenediamine, N,N'-bis(4-aminophenyl)tetramethylenediamine, N,N'-bis(β -hydroxyethyl)-N,N'-bis(4-aminophenyl)tetramethylenediamine, N,N'-bis(4-methylaminophenyl)tetramethylenediamine, N,N'-bis(ethyl)-N,N'-bis(4'-amino-3'-methylphenyl)ethylenediamine, 1,8-bis(2,5-diaminophenoxy)-3,5-dioxaoctane, and acid-addition salts thereof,

ortho-aminophenols chosen from: 2-aminophenol, 2-amino-5-methylphenol, 2-amino-6-methylphenol, 5-acetamido-2-aminophenol, and acid-addition salts thereof,

pyridine compounds chosen from: 2,5-diaminopyridine,

2-(4-methoxyphenyl)amino-3-amino-pyridine, 2,3-diamino-6-methoxypyridine, 2-(β -

methoxy-ethyl)amino-3-amino-6-methoxypyridine, 3,4-diaminopyridine, and acid-addition salts thereof,

pyrimidine compounds chosen from: 2,4,5,6-tetraamino-pyrimidine, 4-hydroxy-2,5,6-triaminopyrimidine, 2-hydroxy-4,5,6-triamino-pyrimidine, 2,4-dihydroxy-5,6-diaminopyrimidine, 2,5,6-tri-amino-pyrimidine, and acid-addition salts thereof,

pyrazole compounds chosen from: 4,5-diamino-1-methyl-pyrazole, 3,4-diaminopyrazole, 4,5-diamino-1-(4'-chlorobenzyl)pyrazole, 4,5-diamino-1,3-dimethyl-pyrazole, 4,5-diamino-3-methyl-1-phenylpyrazole, 4,5-diamino-1-methyl-3-phenylpyrazole, 4-amino-1,3-di-methyl-5-hydrazinopyrazole, 1-benzyl-4,5-diamino-3-methyl-pyrazole, 4,5-diamino-3-tert-butyl-1-methyl-pyrazole, 4,5-diamino-1-tert-butyl-3-methylpyrazole, 4,5-diamino-1-(^p-hydroxyethyl)-3-methylpyrazole, 4,5-diamino-1-ethyl-3-methylpyrazole, 4,5-diamino-1-ethyl-3-(4'-methoxyphenyl)pyrazole, 4,5-diamino-1-ethyl-3-hydroxymethylpyrazole, 4,5-diamino-3-hydroxymethyl-1-methyl-pyrazole, 4,5-diamino-3-hydroxymethyl-1-iso-propyl-pyrazole, 4,5-diamino-3-methyl-1-isopropyl-pyrazole, 4-amino-5-(2'-amino-ethyl)amino-1,3-dimethyl-pyrazole, 3,4,5-triamino-pyrazole, 1-methyl-3,4,5-tri-amino-pyrazole, 3,5-diamino-1-methyl-4-methylamino-pyrazole,

3,5-diamino-4-(~~γ~~^β-hydroxyethyl)amino-1-methyl-pyrazole, and acid-addition salts thereof,

pyrazolopyrimidine compounds chosen from:

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- pyrazolo[1,5-a]pyrimidine-3,7-diamine;
 - 2,5-dimethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;
 - pyrazolo[1,5-a]pyrimidine-3,5-diamine;
 - 2,7-dimethylpyrazolo[1,5-a]pyrimidine-3,5-diamine;
 - 3-aminopyrazolo[1,5-a]pyrimidin-7-ol;
 - 3-aminopyrazolo[1,5-a]pyrimidin-5-ol;
 - 2-(3-aminopyrazolo[1,5-a]pyrimidin-7-ylamino)ethanol;
 - 2-(7-aminopyrazolo[1,5-a]pyrimidin-3-ylamino)ethanol;
 - 2-[(3-aminopyrazolo[1,5-a]pyrimidin-7-yl)-(2-hydroxy-ethyl)amino]ethanol;
 - 2-[(7-aminopyrazolo[1,5-a]pyrimidin-3-yl)-(2-hydroxy-ethyl)amino]ethanol;
 - 5,6-dimethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;
 - 2,6-dimethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;
 - 2,5,N7,N7-tetramethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;

and addition salts thereof and the tautomeric forms thereof, when a tautomeric equilibrium exists;

at least one second oxidation base chosen from para-aminophenol, 4-amino-3-methylphenol, 4-amino-3-fluorophenol, 4-amino-3-hydroxymethylphenol, 4-amino-2-

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methylphenol, 4-amino-2-hydroxymethylphenol, 4-amino-2-methoxymethylphenol, 4-amino-2-aminomethylphenol, 4-amino-2-(β -hydroxyethylaminomethyl)phenol 4-amino-2-fluorophenol, and acid-addition salts thereof; and

at least one meta-aminophenol coupler chosen from meta-aminophenol, 5-amino-2-methoxyphenol, 5-amino-2-(β -hydroxyethyloxy)phenol, 5-amino-2-methylphenol, 5-N-(β -hydroxyethyl)amino-2-methylphenol, 5-N-(β -hydroxyethyl)amino-4-methoxy-2-methylphenol, 5-amino-4-methoxy-2-methylphenol, 5-amino-4-chloro-2-methylphenol, 5-amino-2,4-dimethoxyphenol and 5-(γ -hydroxypropylamino)-2-methylphenol and acid-addition salts thereof;

- wherein said second composition comprises:

at least one 2-electron oxidoreductase enzyme chosen from pyranose oxidases, glucose oxidases, glycerol oxidases, lactate oxidases, pyruvate oxidases and uricases; and

- at least one donor for said enzyme chosen from D-glucose, L-sorbose, D-xylose, glycerol, dihydroxyacetone, lactic acid and salts thereof; pyruvic acid and salts thereof; and uric acid and salts thereof.

71. A multi-compartment dyeing kit, comprising at least two separate compartments wherein a first compartment contains a first composition and a second compartment contains a second composition

- wherein said first composition comprises:

at least one first oxidation base chosen from para-phenylenediamine compounds other than para-phenylenediamine, double bases, ortho-aminophenols, heterocyclic bases, and acid-addition salts thereof;

at least one second oxidation base chosen from para-aminophenols and acid-addition salts thereof, and

at least one coupler chosen from meta-aminophenols and acid-addition salts thereof; and

- wherein said second composition comprises at least one 2-electron oxidoreductase enzyme and at least one donor for said at least one enzyme.

72. A multi-compartment dyeing kit, comprising at least two separate compartments wherein a first compartment contains a first composition and a second compartment contains a second composition,

- wherein said first composition comprises:

at least one first oxidation base chosen from:

para-phenylenediamine compounds chosen from: para-toluylenediamine, 2-chloro-para-phenylenediamine, 2,3-dimethyl-para-phenylenediamine, 2,6-dimethyl-para-phenylenediamine, 2,6-diethyl-para-phenylenediamine, 2,5-dimethyl-para-phenylenediamine, N,N-dimethyl-para-phenylenediamine, N,N-diethyl-para-phenylenediamine, N,N-dipropyl-para-phenylenediamine, 4-amino-N,N-diethyl-3-methylaniline, N,N-bis(β -hydroxyethyl)-para-phenylenediamine, 4-amino-N,N-bis(β -

hydroxyethyl)-2-methylaniline, 4-amino-2-chloro-N,N-bis(β -hydroxyethyl)aniline, 2- β -hydroxyethyl-para-phenylenediamine, 2-fluoro-para-phenylenediamine, 2-isopropyl-para-phenylenediamine, N-(β -hydroxypropyl)-para-phenylenediamine, 2-hydroxymethyl-para-phenylenediamine, N,N-dimethyl-3-methyl-para-phenylenediamine, N,N-(ethyl- β -hydroxyethyl)-para-phenylenediamine, N-(β,γ -dihydroxypropyl)-para-phenylenediamine, N-(4'-aminophenyl)-para-phenylenediamine, N-phenyl-para-phenylenediamine, 2- β -hydroxyethyloxy-para-phenylenediamine, 2- β -acetaminoethyloxy-para-phenylenediamine, N-(β -methoxyethyl)-para-phenylenediamine, and acid-addition salts thereof,

double bases chosen from: N,N'-bis(β -hydroxyethyl)-N,N'-bis(4'-aminophenyl)-1,3-diaminopropanol, N,N'-bis(β -hydroxyethyl)-N,N'-bis(4'-aminophenyl)ethylenediamine, N,N'-bis(4'-aminophenyl)tetramethylenediamine, N,N'-bis(β -hydroxyethyl)-N,N'-bis(4'-aminophenyl)tetramethylenediamine, N,N'-bis(4-methylaminophenyl)tetramethylenediamine, N,N'-bis(ethyl)-N,N'-bis(4'-amino-3'-methylphenyl)ethylenediamine, 1,8-bis(2,5-diaminophenoxy)-3,5-dioxaoctane, and acid-addition salts thereof,

ortho-aminophenols chosen from: 2-aminophenol, 2-amino-5-methylphenol, 2-amino-6-methylphenol, 5-acetamido-2-aminophenol, and acid-addition salts thereof,

pyridine compounds chosen from: 2,5-diaminopyridine,
2-(4-methoxyphenyl)amino-3-amino-pyridine, 2,3-diamino-6-methoxypyridine, 2-(~~2~~^β-methoxy-ethyl)amino-3-amino-6-methoxypyridine, 3,4-diaminopyridine, and acid-addition salts thereof,

pyrimidine compounds chosen from: 2,4,5,6-tetraamino-pyrimidine,
4-hydroxy-2,5,6-triaminopyrimidine, 2-hydroxy-4,5,6-triamino-pyrimidine,
2,4-dihydroxy-5,6-diaminopyrimidine, 2,5,6-tri-amino-pyrimidine, and acid-addition salts thereof,

pyrazole compounds chosen from: 4,5-diamino-1-methyl-pyrazole,
3,4-diaminopyrazole, 4,5-diamino-1-(4'-chlorobenzyl)pyrazole,
4,5-diamino-1,3-dimethyl-pyrazole, 4,5-diamino-3-methyl-1-phenylpyrazole, 4,5-diamino-1-methyl-3-phenylpyrazole, 4-amino-1,3-di-methyl-5-hydrazinopyrazole,
1-benzyl-4,5-diamino-3-methyl-pyrazole, 4,5-diamino-3-tert-butyl-1-methyl-pyrazole,
4,5-diamino-1-tert-butyl-3-methylpyrazole,
4,5-diamino-1-(~~2~~^β-hydroxyethyl)-3-methylpyrazole, 4,5-diamino-1-ethyl-3-methylpyrazole, 4,5-diamino-1-ethyl-3-(4'-methoxyphenyl)pyrazole, 4,5-diamino-1-ethyl-3-hydroxymethylpyrazole, 4,5-diamino-3-hydroxymethyl-1-methyl-pyrazole, 4,5-diamino-3-hydroxymethyl-1-iso-propyl-pyrazole, 4,5-diamino-3-methyl-1-isopropyl-pyrazole, 4-amino-5-(2'-amino-ethyl)amino-1,3-dimethyl-pyrazole, 3,4,5-triamino-pyrazole,

1-methyl-3,4,5-tri-amino-pyrazole, 3,5-diamino-1-methyl-4-methylamino-pyrazole,
3,5-diamino-4-(γ -hydroxyethyl)amino-1-methyl-pyrazole, and acid-addition salts
thereof,

pyrazolopyrimidine compounds chosen from:

- pyrazolo[1,5-a]pyrimidine-3,7-diamine;
- 2,5-dimethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;
- pyrazolo[1,5-a]pyrimidine-3,5-diamine;
- 2,7-dimethylpyrazolo[1,5-a]pyrimidine-3,5-diamine;
- 3-aminopyrazolo[1,5-a]pyrimidin-7-ol;
- 3-aminopyrazolo[1,5-a]pyrimidin-5-ol;
- 2-(3-aminopyrazolo[1,5-a]pyrimidin-7-ylamino)ethanol;
- 2-(7-aminopyrazolo[1,5-a]pyrimidin-3-ylamino)ethanol;
- 2-[(3-aminopyrazolo[1,5-a]pyrimidin-7-yl)-(2-hydroxy-ethyl)amino]ethanol;
- 2-[(7-aminopyrazolo[1,5-a]pyrimidin-3-yl)-(2-hydroxy-ethyl)amino]ethanol;
- 5,6-dimethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;
- 2,6-dimethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;
- 2,5,N7,N7-tetramethylpyrazolo[1,5-a]pyrimidine-3,7-diamine;

and addition salts thereof and the tautomeric forms thereof, when a tautomeric
equilibrium exists;

at least one second oxidation base chosen from para-aminophenol, 4-amino-3-methylphenol, 4-amino-3-fluorophenol, 4-amino-3-hydroxymethylphenol, 4-amino-2-methylphenol, 4-amino-2-hydroxymethylphenol, 4-amino-2-methoxymethylphenol, 4-amino-2-aminomethylphenol, 4-amino-2-(β -hydroxyethylaminomethyl)phenol 4-amino-2-fluorophenol, and acid-addition salts thereof; and

at least one meta-aminophenol coupler chosen from meta-aminophenol, 5-amino-2-methoxyphenol, 5-amino-2-(β -hydroxyethyloxy)phenol, 5-amino-2-methylphenol, 5-N-(β -hydroxyethyl)amino-2-methylphenol, 5-N-(β -hydroxyethyl)amino-4-methoxy-2-methylphenol, 5-amino-4-methoxy-2-methylphenol, 5-amino-4-chloro-2-methylphenol, 5-amino-2,4-dimethoxyphenol and 5-(γ -hydroxypropylamino)-2-methylphenol and acid-addition salts thereof;

- wherein said second composition comprises:

at least one 2-electron oxidoreductase enzyme chosen from pyranose oxidases, glucose oxidases, glycerol oxidases, lactate oxidases, pyruvate oxidases and uricases; and

at least one donor for said enzyme chosen from D-glucose, L-sorbose, D-xylose, glycerol, dihydroxyacetone, lactic acid and salts thereof; pyruvic acid and salts thereof; and uric acid and salts thereof.

73. A ready-to-use composition for the oxidation dyeing of keratin fibers, comprising,

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- 2- β -hydroxyethyl-para-phenylenediamine di-hydrochloride,
 - para-aminophenol,
 - at least one coupler chosen from meta-aminophenol and 2-methyl-5-aminophenol,
 - uricase,
 - uric acid.

74. The composition according to Claim 32, further comprising at least one direct dye. --

REMARKS

Claims 1 to 31 have been canceled and replaced by new claims 32 to 74. Support for these claims can be found in the original specification and claims. No new matter has been added. Applicants now await an action on the merits.